

REMARKS/ARGUMENTS

In response to the Examiner's Office Action of February 23, 2006 the Applicant respectfully submits the accompanying Amendment to the claims and the below Remarks.

Regarding Amendments

Page 1 of the specification has been updated: the first line of Page 1 of the specification has been deleted and replaced by a paragraph entitled "Cross-Reference to Related Applications".

independent claims 1 and 19 are amended to specify that the heater element has a serpentine form that extends between two adjacent electrodes spaced from each other by a gap such that the heater element has a second gap diametrically opposed to the gap between the electrodes. Support for these amendments can be found at page 47, line 11-page 48, line 11 and in pending claims 3 and 21 of the present application;

dependent claims 2 and 20 are amended to clarify that it is the gas bubble which is formed on an axis which extends through the centre of the nozzle;

dependent claims 3, 4, 21 and 22 are amended to conform with amended independent claims 1 and 19;

dependent claims 18 and 37 are amended to delete the term "substantially" from the recitations "each heater element is substantially covered";

independent claim 38 is amended to specify that the heater element has a serpentine form that extends between two adjacent electrodes spaced from each other by a gap such that the heater element has a second gap diametrically opposed to the gap between the electrodes and that in the heating step the gas bubble is formed on an axis which extends through the centre of the nozzle. Support for this amendment can be found at page 47, line 11-page 48, line 11 of the present specification;

dependent claim 39 is amended to conform with amended independent claim 38; and
dependent claims 5-17, 23-36 and 40-54 are unchanged.

It is respectfully submitted that the above amendments do not add new matter to the present application.

Regarding Allowable Subject Matter

The Applicant appreciates the Examiner's indication of the allowability of the subject matter of pending claims 4, 17, 22, 36 and 53 under the conditions stated in the Office Action.

Regarding Claim Objections

Regarding "the axis"

It is respectfully submitted that the above-described amendment to claim 2 (and claim 20) to recite "an axis", provides sufficient antecedent basis in claim 2 for this term.

Regarding "the aperture"

It is respectfully submitted that the above-described amendment to claim 2 (and claim 20) to replace "the aperture" with --the nozzle--, provides sufficient antecedent basis in claim 2 for this term.

Regarding "the serpentine form"

It is respectfully submitted that the above-described amendment to independent claim 1 (and claim 19) to recite that the heater elements have a serpentine form provides sufficient antecedent basis in claim 4 (and claim 22) for this term.

Regarding "substantially"

It is respectfully submitted that the above-described amendments to claims 18 and 37 to delete the term "substantially", provides the correction required by the Examiner.

Regarding 35 USC 103(a) Rejections

Regarding Independent Claims

It is respectfully submitted that the subject matter of above-described amended independent claims 1, 19 and 38, and the claims dependent therefrom, is not taught or suggested by Silverbrook (US 6,019,457) in view of Gerber et al. (US 6,680,668) and further in view of Hiramatsu et al. (US 6,967,312), for at least the following reasons.

In the present invention, the heater elements have a serpentine shape which is configured so that two gaps 159 and 160 are formed between the ends of the heater elements at diametrically opposite sides of the ink chamber, as illustrated in Figs. 75 and 76 of the present application. In this way, the gas bubble formed by the heating of the ink by the

heater elements is centred on the axis of the nozzle, thereby allowing symmetrical formation and controlled position of the bubble within the chamber and therefore more reliable drop ejection (see page 47, line 11-page 48, line 11 of the present specification). These features of the present invention are recited in amended independent claims 1, 19 and 38.

On the other hand, Silverbrook discloses semi-circular or looped heater elements 121 and 122 which have a gap between the elements themselves, as indicated by the Examiner in the citation of Figure 58(b) of Silverbrook. However, the second heater element 122 is a redundant heater element which is only operated if a fault in the operation of the primary heater element 121 is sensed. The identically shaped heater elements ensure that a similar ink drop is ejected using either heater element (see col. 24, lines 29-65 of Silverbrook).

Thus, Silverbrook does not teach or suggest heater elements having the serpentine form claimed in amended independent claims 1, 19 and 38.

Neither Gerber or Hiramatsu make up for this deficiency in Silverbrook. This is because, Gerber merely discloses a fast heat rise transistor (see col. 4, lines 39-56 of Gerber) and Hiramatsu merely discloses circular, looped or arced heater elements (see Fig. 3 of Hiramatsu).

Thus, the subject matter of amended independent claims 1, 19 and 38, and claims 2-18, 20-37 and 39-54 dependent therefrom, is not taught or suggested by Silverbrook either taken alone or in combination with Gerber and/or Hiramatsu.

Regarding Dependent Claims

It is respectfully submitted that the subject matter of dependent claims 7 9, 12, 15, 16, 18, 26, 28, 31, 34, 35, 37, 39, 45, 48, 51, 52 and 54 is not taught or suggested by Silverbrook, Gerber and Hiramatsu further in view of any one or more of Lebens et al. (US 6,631,979), Otsuka et al. (US 5,485,179), Campbell et al. (US 4,870,433), Anagnostopoulos et al. and Moon et al. (US 6,761,433), because none of these further references teaches or suggests heater elements having the serpentine form claimed in amended independent claims 1, 19 and 38.

Thus, the subject matter of amended independent claims 1, 19 and 38, and claims 2-18, 20-37 and 39-54 dependent therefrom, is not taught or suggested by Silverbrook, Gerber and Hiramatsu either taken alone or in combination with any one or more of Lebens, Otsuka, Campbell, Anagnostopoulos and Moon.

It is respectfully submitted that all of the Examiner's objections and rejections have been traversed. Accordingly, it is submitted that the present application is in condition for allowance and reconsideration of the present application is respectfully requested.

Very respectfully,

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